SLOVENSKI STANDARD
SIST EN 61043:2000

01-december-2000

Electroacoustics - Instruments for the measurement of sound intensity - Measurement with pairs of pressure sensing microphones

Electroacoustics - Instruments for the measurement of sound intensity - Measurement with pairs of pressure sensing microphones

Elektroakustik - Geräte für die Messung der Schallintensität - Messungen mit Paaren von Druckmikrofonen

Electroacoustique - Instruments pour la mesure de l'intensité acoustique - Mesure au moyen d'une paire de microphones de pression

Ta slovenski standard je istoveten z: **EN 61043:1994**

ICS:

17.140.50	Elektroakustika	Electroacoustics

SIST EN 61043:2000 **en**

EUROPEAN STANDARD EN 61043

NORME EUROPEENNE

EUROPÄISCHE NORM January 1994

UDC 621.396:534.84:534.612.08:620.1:621.317.743

Descriptors: Electroacoustics, sound equipment, instrument for sound measurement, sound intensity, microphone, microphonic probe, verification, characteristics, field calibration, calibration, instruction manuals, marking

ENGLISH VERSION

Electroacoustics - Instruments for the measurement of sound intensity - Measurement with pairs of pressure sensing microphones (IEC 1043:1993)

Electroacoustique - Instruments pour la mesure de l'intensité acoustique - Mesure au moyen d'une paire de microphones de pression (CEI 1043:1993)

Elektroakustik - Geräte für die Messung der Schallintensität - Messungen mit Paaren von Druckmikrofonen (IEC 1043:1993)

This European Standard was approved by CENELEC on 1993-12-08.
CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

Ref. No. EN 61043:1994 E

FOREWORD

The text of document 29(CO)185, as prepared by IEC Technical Committee 29: Electroacoustics, was submitted to the IEC-CENELEC parallel vote in February 1993.

The reference document was approved by CENELEC as EN 61043 on 8 December 1993.

The following dates were fixed:

- latest date of publication of an identical national standard	(dop)	1994-12-01
- latest date of withdrawal of conflicting national standards	(dow)	1994-12-01

For products which have complied with the relevant national standard before 1994-12-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1999-12-01.

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given only for information.
In this standard, annexes A and ZA are normative and annexes B, C, D and E are informative.

ENDORSEMENT NOTICE

The text of the International Standard IEC 1043:1993 was approved by CENELEC as a European Standard without any modification.

ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD WITH THE REFERENCES OF THE RELEVANT EUROPEAN PUBLICATIONS

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

NOTE : When the international publication has been modified by CENELEC common modifications, indicated by (mod), the relevant EN/HD applies.

IEC Publication	Date	Title	EN/HD	Date
651	1979	Sound level meters	EN 60651	1994
942	1988	Sound calibrators	HD 556 S1	1991

NORME INTERNATIONALE
INTERNATIONAL STANDARD

CEI
IEC
1043

Première édition
First edition
1993-12

Electroacoustique – Instruments pour la mesure de l'intensité acoustique – Mesure au moyen d'une paire de microphones de pression

Electroacoustics – Instruments for the measurement of sound intensity – Measurement with pairs of pressure sensing microphones

Bureau Central de la Commission Electrotechnique Internationale 3, rue de Varembé Genève, Suisse

Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE V

Pour prix, voir catalogue en vigueur
For price, see current catalogue

CONTENTS

Clause Page

Annexes

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROACOUSTICS – INSTRUMENTS FOR THE MEASUREMENT OF SOUND INTENSITY – MEASUREMENT WITH PAIRS OF PRESSURE SENSING MICROPHONES

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) The formal decisions or agreements of the IEC on technical matters, prepared by technical committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.

3) They have the form of recommendations for international use published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.

4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.

International Standard IEC 1043 has been prepared by IEC technical committee 29: Electroacoustics.

This standard completes the series of International Standards already prepared or in preparation by subcommittee 1 of ISO committee 43: Acoustics/noise, ISO/TC 43/SC1.

The text of this standard is based on the following documents:

Six Months' Rule	Report on Voting
29(CO)185	29(CO)211

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

Annex A forms an integral part of this standard.

Annexes B, C, D and E are for information only.

INTRODUCTION

This International Standard specifies the requirements for sound intensity instruments, comprising sound intensity probes and processors, which detect sound intensity by pairs of spatially separated pressure sensing microphones. These instruments, and others employing different detection methods, are still the subject of development.

Sound intensity instruments have two main applications. The first is the investigation of the radiation characteristics of sound sources. The second is the determination of the sound power of sources, especially *in situ*, where sound intensity measurement enables sound power determination to be made under acoustical conditions which render determination by sound pressure measurement impossible.

This International Standard applies to instruments to be used for the determination of sound power in accordance with the requirements of ISO 9614-1 and ensures well-defined performance for instruments used in other applications.

Specifications and tolerances are based on current instrument technology and on typical industrial requirements for dynamic capability index.

Requirements for the verification of performance of probes and processors are written in terms of type tests. A scheme for periodic verification, serving as the basis of the periodic recalibrations required in many countries, is given in annex A.

Probes and processors are treated separately and together; in the latter case they are called "instruments".

ELECTROACOUSTICS – INSTRUMENTS FOR THE MEASUREMENT OF SOUND INTENSITY – MEASUREMENT WITH PAIRS OF PRESSURE SENSING MICROPHONES

1 Scope

The primary purpose of this Standard is to ensure the accuracy of measurements of sound intensity applied to the determination of sound power in accordance with ISO 9614-1. To meet the requirements of that standard, instruments are required to analyse the sound intensity in one-third octave or octave bands, and optionally to provide A-weighted band levels. They are also required to measure sound pressure level in addition to sound intensity level to facilitate the use of the field indicators described in ISO 9614-1.

This International Standard only applies to instruments which detect sound intensity by pairs of spatially separated pressure sensing microphones.

This International Standard specifies performance requirements for instruments used for the measurement of sound intensity, and their associated calibrators.

The requirements are intended to reduce to a practical minimum any differences in equivalent measurements made using different instruments, including instruments comprising probes and processors from different manufacturers.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 9614-1: 1993, *Acoustics – Determination of sound power levels of noise sources using sound intensity – Part 1: Measurement at discrete points*

IEC 651: 1979, *Sound level meters*

IEC 942: 1988, *Sound calibrators*

IEC 1260: 19XX, *Specification for octave-band and fractional octave-band filters* (under consideration). (Revision of IEC 225: 1966)

3 Definitions

For the purpose of this International Standard, the following definitions apply.

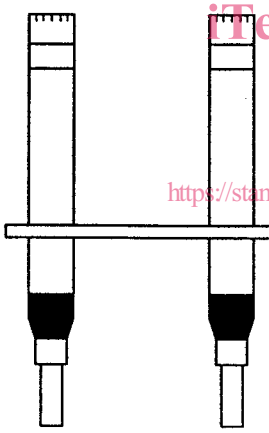
3.1 **sound intensity probe:** Transducer system from which signals may be processed to obtain the sound intensity component in a specific direction.

3.2 **p-p probe (also known as a two microphone probe):** Probe composed of two pressure sensing microphones spaced apart by a fixed and known distance, in which the sound pressure component is measured by the two microphones and the mean value is considered as the sound pressure existing at the reference point of the probe, while the sound pressure differential is used for the purpose of deriving the sound particle velocity component.

NOTES

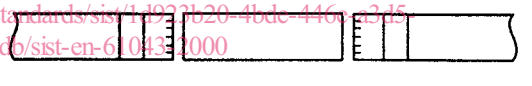
1 A side-by-side p-p probe has the two microphones arranged as shown in figure1.

2 A face-to-face p-p probe has the two microphones facing each other and separated by a spacer as shown in figure 2.



IEC 1 231/93

Figure 1 – A side-by-side p-p probe



IEC 1 232/93

Figure 2 – A face-to-face p-p probe

3.3 **reference point of a probe**: Point at which the sound intensity is deemed to be measured.

NOTE – The reference point of a probe is not necessarily the physical midpoint, but occurs halfway between the effective microphone centres.

3.4 **probe axis**: Axis passing through the reference point and along which a component of particle velocity is sensed.

3.5 **reference direction**: Direction of incidence of plane progressive waves on the probe, parallel to the probe axis, for which the sound intensity response of the probe is specified.